

LAN- 4-2-100

Refuge Manager, Lake Andes Refuge,  
Lake Andes, South Dakota

March 22, 1968

Assistant Regional Supervisor, Division of  
Wildlife Refuges, Minneapolis, Minnesota

In reply refer to: RF

Annual Water Program - 1968

Your proposed water management program is approved. The report on conditions is greatly appreciated and enlightening. I, for one, did not realize your evaporation rate was that high during summer months. It is a good thing we have the artesian flow going for us in Owen's Bay.

A comment from the Regional Engineer is attached.

Smith  
3-22-68

Edward J. Smith

Attachment

EJSmith:se 3/22/68

_____	Carpenter	_____
_____	Monnie	_____
_____	Morgan	_____
_____	Smith	_____
_____	Aultfather	_____
_____	Crozier	_____
_____	Dill	_____
_____	Duncan	_____
_____	Dundas	_____
_____	Hoffman	_____
_____	Joanston	_____
_____	Reilly	_____
_____	Rollings	_____
_____	Winship	_____

UNITED STATES GOVERNMENT

# Memorandum

TO : Regional Supervisor, Division of Wildlife Refuges DATE: March 20, 1968

FROM : Regional Engineer

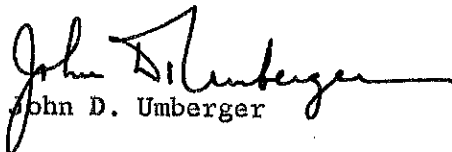
In reply refer to:  
EH-R-Lake Andes  
Annual Water Program

SUBJECT: 1968 Annual Water Program - Lake Andes NWR

We have reviewed the subject program for 1968 and have no comments except the following:

When the weir box for the artesian well is complete, at least monthly readings of the well, outflow should be recorded on the monthly gauge report form.

The new gauge form in use since May 1967 is a good improvement also.

  
John D. Umberger

Attachment



Route to Engineering

MAR 4 1968

## ANNUAL WATER MANAGEMENT PLAN 1968

### A. General Water Uses.

Lake Andes is divided into three management units. The outlet of the lake is located at the southern end of the South Unit. The maximum number of stop logs are maintained at each of the control structures to maintain the highest possible water level in each unit.

Water flows from the North Unit to the Center Unit at an elevation of 1436.26. The elevation of the control between the South and Center Unit is 1434.85, while water flows out of the South Unit into the Missouri River at an elevation of 1437.25.

Owens Bay is separated from the South Unit by a dike which contains a control structure. The level of Owens Bay is controlled by the discharge from the artesian well. Excess water from Owens Bay is discharged into the South Unit.

#### 1. North Unit.

Water levels in the unit rose slightly during the spring thaw. A heavy rain received during the end of June in the watershed north of Lake Andes caused the lake level to rise over a foot. However the level never rose high enough to spill over the emergency spillway into the Center Unit. Due to the heavy June rains the North Unit was the only unit in which water levels showed a net increase for the year.

Although the breeding pair count was down 50 percent from the previous year, overall production increased 50 percent. This was attributed to higher production in breeding pairs.

Aquatic plant production on the unit was very good. The maximum depth of the unit was 5 feet during December.

#### 2. Center Unit.

Water levels in the Center Unit gradually declined. Although some rise was noted after the spring thaw and the June rains, a net loss of slightly over a foot was recorded. Broad expanses of bare mud flats existed along the shoreline during the fall. The maximum depth of the Center Unit was 3 feet during December.

REG. DIR.	
DEPUTY RD	
SECY. RD	
CONS. ED.	
SAC. OFFR.	
WETLANDS	
ARD-OPS.	
HATCH	
FLY OFF.	
FOR CORPS	
MGT. & ENF.	
PROPERTY	
ED. AID	
FISH SVCS.	
RIVER BAS.	
WILD SVCS.	
ARD-A & E	
FINANCE	
MGT. OPS.	
PERG. MGT.	
PROP. MGT.	
LIBRARY	
MAILROOM	

Like the North Unit, waterfowl breeding pairs were down from the previous year's count. Production however increased from 262 ducks in 1966 to 372 in 1967.

Aquatic plant production in this unit was down considerably from the previous year. The water was extremely turbid throughout the year and this may have been a contributing factor in the decline in the amount of aquatic plant growth.

Commercial fishermen continued their operation in the unit. They netted approximately 60,000 lbs. of bullheads during the year.

### 3. South Unit.

Water levels in the South Unit gradually declined throughout the year, dropping just under a foot by December. At the end of the year the level of the lake was approximately 5.1 feet below the suggested management level of 1436.75. The Maximum depth of the unit is 4 feet. Breeding pair counts on the unit were comparable to the previous year's count. Production was also similar to last year's production figure of 117.

Commercial fishing of bullheads continued and approximately 135,000 lbs. were taken during the year.

The water was much clearer than either the North or Center Units. This may have been a contributing factor affecting the growth of aquatics.

### 4. Owens Bay.

Water levels fluctuated little throughout the year. Higher water levels were maintained during January and February to facilitate in the Mallard banding program. Water levels were dropped during the spring and summer to provide more shoreline habitat for broods.

No check has been made on the 15,000 Bass fingerlings which were stocked during 1966. However while conducting brood counts several small schools of the fish were seen. At that time they measured approximately 10 inches. Aquatic plants continue to show growth and good seed production.

B. Summary.

Precipitation for the year totaled 21.51 inches, .29 inches above normal. July and August were relatively dry; the 9 inches of rain received during June helped to bring the total annual precipitation up to normal.

Commercial fishing continues and since the average size of the bullheads being taken has increased, it appears that the catch is exceeding reproduction. At the end of the year the average bullhead taken weighed close to a pound.

Special development funds became available for use in construction of an equipment storage building and for renovating the artesian well at Owens Bay. Although most of the funds were used in the building, some work was done on the well outlet.

The Soil Conservation Service worked up levels which showed water could easily be diverted from the well to the series of potholes north and west of the well. To accomplish this, a shallow ditch was constructed and progress has been made on the construction of a wier box. The wier will facilitate the diversion of water through a concrete culvert to the north. When completed this improvement will provide additional small wetlands that should increase the waterfowl production on the refuge.

C. Recommendations for Management during 1968.

Lake levels declined to the point where it will take several flash floods to fill it in one season. If the cyclic behavior of this lake continues one might predict that the lake will go completely dry in the next three years. However, we shall continue to plan for optimum water levels in the units. We therefore recommend that a maximum level of 1436.75 be maintained if adequate water is received.

Rather than recommend a draw down for Owens Bay we plan to evaluate the quality and quantity of the aquatic plant production and upon these determine when and if the pool should be drawn down. At the present time quality and quantity of the aquatics seems to be good and we see no need for draw down.

IMPOUNDMENT DATA - 1967

	North Unit			Center Unit		
	Average Elevation	Area (Acres)	Capacity (Acre Feet)	Average Elevation	Area (Acres)	Capacity (Acre Feet)
January	1433.98	440	920	1431.59	1875	5800
February	1433.98	440	920	1431.59	1875	5800
March	1433.98	440	920	1431.59	1875	5800
April	1434.09	448	940	1431.88	1925	6200
May	1433.95	440	920	1431.96	1935	6400
June	1433.73	424	840	1431.91	1900	5700
July	1435.82	552	1900	1431.98	1945	6500
August	1435.20	524	1560	1431.42	1850	5400
September	1434.48	480	1140	1430.94	1775	4600
October	1434.27	468	1060	1430.52	1725	3800
November	1434.27	468	1060	1430.52	1725	3800
December	1434.27	468	1060	1430.52	1725	3800

	South Unit			Owens Bay Unit		
	Average Elevation	Area (Acres)	Capacity (Acre Feet)	Average Elevation	Area (Acres)	Capacity (Acre Feet)
January	1432.56	1620	7000	1440.62	220	420
February	1432.56	1620	7000	1440.98	230	510
March	1432.56	1620	7000	1441.16	233	540
April	1432.27	1605	6200	1440.44	215	380
May	1432.40	1610	6600	1440.24	207	340
June	1432.25	1605	6200	1440.02	200	300
July	1432.59	1630	7200	1440.54	217	400
August	1432.17	1600	6000	1439.86	195	270
September	1431.71	1580	5600	1439.58	180	220
October	1431.61	1570	5400	1440.81	225	460
November	1431.61	1570	5400	1440.97	230	510
December	1431.61	1570	5400	1440.97	230	510

SUMMARY OF INFLOW AND OUTFLOW 1967

	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
North Unit	3.15	+29	3.44	476	1637.4	0	1637.4
Center Unit	3.15	-1.07	2.08	1,893	3937.4	0	3937.4
South Unit	3.15	-.95	2.20	1,600	3520.0	0	3520.0
Owens Bay	3.15	+.35	3.50	205	<u>717.5</u>	<u>80</u>	<u>797.5</u>
						0	9992.3

1967 In-flow to refuge = 9992 Ac.Ft  
 " Outflow from South Unit = 0 Ac.Ft